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ABSTRACT

Libraries are part of a larger information infrastructure which must be understood before planning professional education for librarianship. Research is needed in three areas: (1) options within overall library objectives, (2) information needs of different user audiences, and (3) technological and economic descriptions of information systems. Based on the objectives of the National Commission on Libraries and Information Science proposal, professionals will need to have competencies in five major areas: organization of information, information needs and information use, information technologies, research methods, and management. Continuation of current patterns of professional education will lead to overpopulation of undertrained individuals. To meet short-term needs seminars, institutes, and certificate programs should be encouraged. Long term needs will require that professionals be made acquainted with the total information process and that a basic science of information be recognized as a scholarly discipline. (Author/PF)

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NATIONAL COMMISSION ON LIBRARIES AND INFORMATION SCIENCE
NATIONAL PROGRAM FOR LIBRARY
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RELATED PAPER
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MANPOWER AND EDUCATIONAL PROGRAMS FOR MANAGEMENT, RESEARCH, AND PROFESSIONAL GROWTH IN LIBRARY AND INFORMATION SERVICES

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Describes the major components of a support program required for the national program of library and information services described in the second draft of the NCLIS Program Document. Special attention is given to the education and manpower programs necessary to provide competent professional personnel and research and development programs which are pertinent to the national program and can be transferred to state and multistate programs.

OCTOBER, 1974

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Manpower and educational programs for management, research, and professional growth in library and information services

Paper of Amplification for the National Commission for Libraries and Information Science

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Introduction

One of the critical challenges of our age is to understand and to manage within tolerable and equitable limits the incredible richness of information resources today. The Program proposed by the National Commission (1) is a bold effort to deal with a portion of this problem. The paper which follows is an attempt to describe the educational programs necessary to provide manpower to support the design, development, and management of the Program. Both short-term and long-term approaches are discussed, as well as some factors which might inhibit fulfillment of the Commission's objectives.

The paper is divided in six parts. Section A is made up principally of excerpts from the Preliminary Draft of the Program of the National Commission on Libraries and Information Science to provide context and a framework for this paper. In the belief that the assumptions of an author form an important part of the frame of reference, these are briefly discussed in Section B.

Section C, in response to the charge of the Commission to the author, briefly discusses research and development needs under three rubrics: policy research, information needs research, and technological and economic research and development.

Section D outlines and discusses the professional skills, knowledges, and attitudes necessary to provide an effective and well-trained manpower base to carry out the program envisaged by

the National Commission. Building on these bases, in Section E the author discusses manpower questions and suggests educational approaches that might be taken to meet both short-term and long-term manpower and research needs. Section F is a summary of the major points of this paper.

A. Excerpts from NCLIS Report

The brief excerpts in this section indicate some of the diversity of problems and variety of contexts within which this report is written. It should be noted that these are selected excerpts, and as such may show the author's bias. Not all objectives are included because it was felt that some were not applicable to this paper or were redundant.

Objective 1: Ensure that basic minimums of library and information services adequate to meet the needs of all local communities are satisfied. (p.49)

> "It is, therefore, imperative that the National Program provide that local communities attain certain basic levels of service and materials and that their human resources are also strengthened." (p.49)

Objective 2: Provide adequate special services to special communities, including the unserved. (p.50)

> "Such groups include the poor, the illiterate, the blind, the visually and physically handicapped, the ethnic minorities, American Indians on reservations, the very young, senior citizens, other parts of our society." (p.50)

"...and where such services exist, the personnel who operate them are sometimes perceived as insensitive and unresponsive." (p.51)

Objective 4: Develop and continually educate the human resources required to implement a National Program. (p.54)

"The program must have people in it who are competent, sensitive to user needs, and able to employ new techniques." (p.54)

"The domain of library and information science is interdisciplinary." (p.55)

"It is essential, therefore, that the National Program give consideration to both basic and continuing education of personnel at all levels, professional and paraprofessional. A new approach to educational curricula will be needed in library and information science if librarians, information scientists, library technicians, and auxiliary personnel are to learn to function as an interdisciplinary team." (p.55)

"...will require new approaches to manpower development, continuing education, technical training, trustee orientation, and other matters relating to human resources." (p.56)

Objective 6: Make the private sector an active partner in the development of the National Program. (p.58)

"The private sector.../is/ initiating new types of information services." (p.58)

"Taken together, these new commercial or private non-profit information services are growing rapidly in number, function, and value." (p.58)

Objective 8: Plan,develop, and implement a nationwide network of library and information service. (p.62)

(Note: too extensive to be excerpted, but the following words and phrases will provide context and flavor)

interstate
computer and telecommunications facilities
development of networks

common technical standards
reprography and micrographics
centralized services for networking
cooperative, time-shared, multi-institutional approach to computer use
integrate teletype, audio, digital, and video signals into a single system
to support research and development
world-wide information network

B. Personal Assumptions and Observations

In the belief that communication is facilitated by knowing where a writer stands, the author briefly discusses here some of his assumptions and hesitations. He states these because he believes in the importance of the broad goals of the Commission. There is the danger, however, that these goals can be diluted or even destroyed if the profession does not honestly recognize its weaknesses, and reverts instead to a defensive posture which can only undermine the implementation of the Commission's proposed program.

1. Libraries are part of a larger information infrastructure. A failure to understand the operation of the whole system and the role a library can play in the information transfer process will tend to isolate the library even more than it presently is. Such a failure will also strengthen alternative agencies and services more sensitive to real user needs. Though the NCLIS report mentions the larger

context several times, it does not delineate the basic need: an understanding of the total system of information transfer in society - how, why, what, where, and when.

2. The tradition of the library as conservator, as archive, may be unsuitable to the concept of true information service. The archival function is a necessary one, but in order to meet the needs of information service it will be necessary to develop new methods of collecting, organizing, and purging highly dynamic information. Too much attention is still paid to formal information packages, i.e. books and media packages, which satisfy only a small portion of the real demands for information. The present design of information systems are dictated by the package rather than by the needs of people. They are both necessary.

3. There is a real need to develop a societal consciousness of the value and pervasive role that information plays in our lives. We swim in a sea of information, but, like fish, we really do not know much about the water. The recognition of the value of information may well initiate a power struggle, in which the profession is poorly equipped because it is institution-bound.

4. Despite what may seem to be disparaging observations in the last several paragraphs, the library as a

societal agency - especially the public library - may be the one agency in society with the necessary neutrality and cultural halo to act as a true information service for all types of audiences in society. Such action, however, will require some fundamental changes in professional attitudes and abilities. Perhaps more fundamental is the necessity for change in those persons and groups - e.g. trustees, academic faculties, local and state governments, etc. - whose attitudes and decisions affect the budgets and operations of libraries and related information centers.

5. As a profession, librarians have traditionally held low expectations of themselves and of what they could and should do. There is a need now to develop a profession of breadth, of confidence, and of high ability. The problem may well be outside the profession in, for example, the image of the library and librarians. In the context of this paper, the profession must develop more fruitful interfaces with the public at large. This paper attempts to address these problems, both in short-term and long-term contexts.

C. Research and Development

The charge to the author of this paper stated "...Special attention should be given to the education and manpower programs necessary to provide competent professional personnel and research and development programs

which are pertinent to the national program and can be transferred to state and multi-state programs." (italics added.) There are at least three levels of research and development required in this context. There is a larger set of problems concerned with complex systems which will be remarked on briefly in Section E.

1. Policy research is decision-oriented research and it operates in real time. As James Coleman has pointed out:

> "The defining characteristics of policy research are two: the research problem originates outside the discipline, in the world of action; and the research results are destined for the world of action, outside the discipline." (2)

At this stage in the development of the Commission's Program, policy research (a) can present the range of options within the overall objectives of the Program; (b) can state and discuss advantages and disadvantages of a particular course of action, sometimes within a probabilistic framework; and (c) can make recommendations. Within the context of the Commission's objectives, effective policy research can isolate and define areas where significant data can be collected, analyzed, and used for planning and decision.

We must be very clear, however, that this is developmental research, with all the pitfalls of subjectivity, unclear objectives, and unconscious or culturally biased analyses and interpretations. Such

research can point to and illuminate problems for which significant data either exists or can be easily collected. It can thereby reduce some of the areas of uncertainty in the planning process.

Within the context of the Commission Program there are several areas where policy research is needed. At this stage, such research would be concerned with surface analysis, defining the elements of the problems noted below.

(a) What is the infrastructure of information services presently operating in the United States?

(b) What present and potential technologies are necessary to support the dissemination of information in this country? And what are the economics of each technology?

(c) What are the similarities and differences of varying kinds of information audiences and information environments and what is their effect on system design if we assume the total information service envisaged in the NCLIS Program?

(d) What are the political and legal problems which constrain or enhance such a program?

(e) Is there sufficient data for the definition of a set of "information indicators?" How can these be used as a framework for policy?

2. Information Needs Research. Recognizing that such research on information needs can be endless, there, are nevertheless important areas which can provide immediate input in support of the Commission Program. (3) Most studies of this nature in the past have not been truly generalizable. Consequently we have a wealth of data, very little of which can be used outside specific situations studied. (3) We need analytic studies of the information needs of different kinds of audiences: for example, school systems (pupils, teachers, and administrators); decision makers in local and state governments; professionals such as doctors, engineers, nurses, lawyers, and social workers; the research communities in governmental, academic, and industrial establishments; higher education; library users.

3. Technological and Economic Research and Development This area has been and will be a major area of research and development. However, at present systems design rests almost exclusively on the packages entering the system and the available technologies. This report urges that consideration now be given to the fact that people and their information needs, in whatever context, are as important to systems design as books and other information packages.

With this caveat, the following are some of the immediate technological and economic concerns.

(a) cost-effectiveness studies of the range of technologies in support of inter-library lending - including mail, messenger, facsimile, computer networks, and telecommunication systems.

(b) technologies and attendant costs of serving specialized audiences through library networks and alternative networks.

(c) technologies and attendant costs of serving specialized audiences, both sophisticated and naive, within local systems, with special attention paid to the urban disadvantaged, Indians on reservations, and rural populations. Such audiences may require less technology as direct service than an increase in sensitive personal and professional attention.

(d) the comparative economics of various computerized bibliographic and other data bases for catalog information, location data, bibliographic access and retrieval, and for "housekeeping" activities of network members.

(e) standardization and inter-network compatability.

(f) the role and function within information networks of

state library agencies
large research libraries
local library systems
special libraries
subject information centers

publishers
commercial information services
citizen information centers
museums
mass media
historical associations and archives

Determination of role and function of these various information agencies exists in a political and legal context, with all the ambiguities, compromises, and power plays inherent in such situations.

There are obviously dozens of other researchable and more specific technological problems. It is not, however, the intent of this paper to list all possible problems, but rather to delineate general categories of research.

State and multi-state agencies should obviously be concerned with the design, development, and evaluation of networks, including costs and economies of scale. State library agencies, especially in the context of federalism and revenue sharing, must begin to exercise leadership rather than authoritarian bureaucracy. This is obviously a delicate line, but there is a pressing need for an effective leadership and voice at the state level. It is critical that basic standard norms be agreed upon and that inter-network compatibility be established at the beginning as a necessary framework for planning. It is necessary to include school media centers in any overall plan,

for it is in such centers that young people develop the patterns and habits which will allow them to make effective use of information in the future.

D. Skills, Knowledges, and Attitudes Needed

In order to implement the Program envisaged by NCLIS, the professional manpower required will need to have certain competencies. The list that follows is not complete, but is intended as a frame of reference when discussing actual educational programs. (5) It is extremely doubtful that all professional personnel will possess all the competencies listed. It is important however that knowledgable awareness exist among information professionals so that decision-making can be informed, justified, and relevant to the broad objectives of the Commission Program. These competencies will provide the professional with the ability to analyze critically new developments which may alter systems and their design. They are grouped and discussed under five general headings: organization of information; information needs and information use; information technologies; research methods; and management.

1. Organization of information

The principal objective of these competencies is to assure complete familiarity with both conventional

and (currently) unconventional systems for information organization.

- -knowledge of and skill in standard library descriptive cataloging, library classification systems, and library subject analysis
- -knowledge of and skill in indexing and abstracting
- -knowledge of and skill in analyzing information for computerized retrieval systems, including vocabulary control, intersystem vocabulary compatibility, and computer file organization
- -ability to transfer these knowledges and skills to information in any format and in any media
- -ability to utilize these knowledges and to improvise from them to design information systems to meet the information needs of a variety of publics, from the sophisticated to the naive
- -extensive familiarity with machine-readable bibliographic systems, e.g. MARC, etc.
- -knowledge of basic types of information resources and services and their usefulness to various publics

2. Information Needs and Information Use

- -knowledge about information-seeking and information-using behavior in all types of populations from the naive to the sophisticated.
- -knowledge of community organization and community information structures (community = city, neighborhood, school, company, government agency, university, etc.)
- -ability to analyze community information processes and to translate findings to improved information services.
- -knowledge of organization theory and the role of information in the organizational and decision-making processes.
- -participation in experiential learning situations to develop self-awareness in information/communication contexts.

-ability to work with a variety of populations in information situations and to understand and serve their needs in a variety of media.

-knowledge of the information transfer potential of various media to different audiences, e.g. television, books, newspapers, radio, etc.

-knowledge of the roles of the growing information industry in meeting information needs for varying populations.

-knowledge of interpersonal and non-verbal communication.

3. Information Technologies

-knowledge, both general and specific, of the impact of computers, telecommunications, micrographics, and reprography on the current operations of information agencies such as libraries and networks.

-skill in computer programming (note: this is not necessarily intended to train programmers but rather to train intelligent consumers of specialized systems design).

-knowledge of computer architecture, including knowledge of the functions of storage devices, central processing unit, input and output devices, and computer communication systems.

-knowledge of telecommunications technology and its relationship to the transfer of bibliographic information, media images, and systems information.

-knowledge of networking and support technologies, including the ability to analyze information flow, channel capacity, and comparative costs in systems ranging from interlibrary lending to bibliographic networks such as OCLC, from management information systems to on-line conferencing.

-knowledge of and skill in systems analysis of libraries, information retrieval systems, and information networks of all types.

-knowledge of cost-benefit analysis and ability to apply suitable criteria in judging relative merit of competing systems.

-knowledge of legal constraints resulting from technological application, including copyright, regulations of the FCC, and information for a fee services.

-knowledge of the technology and methods of "alternative" information dissemination systems such as book and media publishing, television and radio, and newspapers.

-knowledge of and beginning skill in the production of messages in film, video, and other media.

It is obvious that high skill and deep knowledge in all of these technologies is not possible. The objective for the acquisition of these competencies is to develop (a) an informed skepticism concerning the application of various information technologies and (b) an ability to make technological choices based on rational criteria and extensive systems knowledge. It is worth noting that the present library grew out of two major technological revolutions of mankind: the development of writing and the invention of printing. We are now faced with a third revolution - which goes under the general rubric of information technology. We must be able to marry the humanistic base of the library with the technological restlessness and social impact of this information revolution. Even within the temporally limited

context of the Commission's program, the necessity for informed technological choice is critical, because these decisions will establish patterns of services for at least the next quarter century if not longer.

4. Research Methods

-beginning skills at least in the methods of experimental design and survey research.

-skills in problem formulation, data collection, data analysis, and data interpretation.

-ability to develop and apply suitable criteria for the evaluation, including cost-effectiveness, of comparable systems.

-ability to develop and use mathematical models and/or simulation of library and information system networks.

-understanding of the role and approach of policy research in planning and policy development.

The principal objectives of the development of these competencies are (a) to educate critical consumers of research results, especially in the social sciences and applied technology; and (b) to develop the ability to participate effectively in the design, analysis, and interpretation of relevant experiments and research. It is not the purpose here to turn out highly competent and original researchers, though some professionals, because of background and ability may become such researchers.

5. Management

In reviewing potential competencies under the rubric of management, it is necessary to realize that not all people have the potential of being "good" managers, though they may be able to make many other professional contributions to the program of the National Commission. This implies that potentially "good" managers may enter the profession with inherent qualities of leadership and an inchoate sensitivity to the types of problems and problem solutions that are part of the managerial process. The real question then exists in identifying those persons who have those attributes that make "good" managers. The competencies below should be seen in this context.

-knowledge of the role and function of management in an organization, including the variety of managerial styles and their effectiveness.

-knowledge of the structure and function of units and departments in information agencies such as libraries.

-ability to envisage and implement alternative organizational structures for better utilization of personnel.

-knowledge of and skill in budgeting and cost-accounting.

-ability to develop and implement policy and to interpret policy both to parent organization and to staff.

-ability to isolate and to define problems and to develop the necessary criteria and action for their solution.

-ability to develop effective personnel policies, including criteria for selection and evaluation.

-ability to work easily and effectively with personnel at all organizational levels and to develop management contexts in which the full potential of staff can be tapped and utilized.

-knowledge of the varieties of organizational structures and ways that they can be altered to meet different kinds of problems and organizational needs.

E. Manpower and Educational Needs

Within the context of the competencies discussed above, there is a desperate and pressing need for persons who can deal with the total information process. These are persons for whom the process and movement of messages are important, not the specific device (book, computer, or video tape), nor the particular agency (library, computer utility, or educational system). With very few exceptions such persons are not being graduated from library schools. The exceptions, one may suspect, are due more to individual personality and ability than to the professional education they receive. This has something to say about recruiting for the profession and will be remarked on below.

The following summary of library manpower is derived from the study in draft form of the Bureau of Labor Statistics (6) and from North American Library Education Directory and Statistics 1971-1973 (7).

1. The total employment in libraries is expected to rise by about 60 percent between 1970 and 1985 (235,000 to 374,000). In the same period, of this total the total librarian employment is predicted to rise about 41 percent. This latter figure includes graduates from both bachelor's and master's programs and from both accredited and non-accredited programs.

2. In 1972-73, between 8,000 and 8,500 Masters degrees were granted, about 80 percent of which were from accredited Masters programs.

3. The main source of demand for librarians through 1985 will be replacement requirements. Replacement of those who leave the labor force will greatly exceed the numbers needed to fill newly added positions.

4. The demand will remain strong for library personnel with certain types of specialized training, community outreach abilities; media training; and computer capabilities.

5. In 1973, there were about 59 programs for library technical assistants, one-third of which were in California. Data on these programs are difficult to determine. Many have no full-time faculty and enrollment is small. Most programs are at the developmental stage. (8)

The shrinkage in demand is already apparent to current library school graduates, because of the limited vision of the schools and the sense of being institution-bound by their graduates. It appears that mobility, quality, specialized competencies, and justified self-assurance are necessary attributes in finding professional employment. It also appears that many libraries are not yet prepared to use effectively the better graduates from present professional programs.

There are probably enough professionals presently in the field, plus those who will be graduated from professional

library schools, to provide the necessary manpower for the Commission's Program. However, only a minority are sufficiently prepared, either by training or by temperment, to provide the skills, knowledges, and leadership potential necessary for the Program. In addition, because of the failure of library education in the past to prepare students for change, many professionals have cultivated an antagonism to systems technology and development, and, in many cases, to true public service. This is a generalization and should obviously be treated as such. This has forced the library profession to turn to outside specialist advice with concomitant loss of control over decisions that determine the shape and role of professional work.

There are two possible approaches to manpower development and professional education necessary to support the Commission's Program. The first concentrates on short-term efforts and limited goals, centered principally around continuing professional education and upgrading of selected working professionals. The second focuses on long-term changes in professional education and professional definition. Education must focus on the training of both operational and research personnel competent to design, manage, and evaluate information systems and networks and who at the same time are sensitive

to human needs for information at all levels of society.

1. Continuing Professional Education is the one area of educational concern that, if properly planned and implemented, might have real and measurable impact during the 1970's on the profession and its ability to respond effectively to the needs of the NCLIS proposals. However, to assure a successful continuing professional education program, it will be necessary to convince not only the library professional community in the efficacy of the NCLIS program, but also a broad spectrum of other information interests including -

   the science and technology information community
   the growing information industry
   the publishing industry
   the "community of the information-poor"
   those areas of telecommunication and computer interests which touch the concerns of the NCLIS program
   legislators and executives on the state and national level

The NCLIS-commissioned report on continuing education (9) issued in May 1974 developed an extensive long-range plan, which has been endorsed by representatives of relevant associations and agencies. Within the framework of this

larger plan a two-pronged program of continuing education should be encouraged. The first is a series of one to two week institutes designed around three competencies:

-experiential seminars to develop self-awareness, receptivity to change, managerial effectiveness, and ability to work with a variety of populations in information/communication contexts.

-network design, technology, and evaluation, including bibliographic and other data bases, centralized processing systems, and telecommunications.

-information needs and uses, including the study of the role of information in communities and organizations of all types and community analysis.

At present such institutes, when they exist, are offered as one-shot events by schools and private organizations. This paper urges that these three recommended institutes be designed in a continuous framework, say over the period of one year. It is further recommended that participants be required to complete all three in order to receive some formal certification upon completion. There should be careful selection of participants in order to assure a high probability of impact, a sort of leaven in the loaf. Over a three year period, i.e. three generations of participants, approximately 600 to 1,000 persons should be programmed in these institutes. Support for these institutes should come from the federal government with state, local, and private agencies underwriting some of the participant costs.

A second approach suggests programs toward the Certificate of Advanced Study (CAS) or whatever variant is appropriate to local situations. These would be programs of longer duration designed to develop as many of the competencies listed in Section C as possible for professionals (including non-library professionals in the information field) who would spend one full year in the program in seminars, courses, and internships. Such activity could range up to three years in duration in order to fit the working requirements of professionals and their working environments. For such a program, it might be possible to develop Continuing Education Units (CEU) which could be transferred from one institution to the "home" institution. Regional consortia of cooperating library, information, and communication schools should be encouraged to examine the potential of joint instructional efforts and the exchange of CEU's. Start-up costs should be underwitten by the federal government, together with continuing costs of participants' tuition and associated administrative costs .

A word of warning should be stated here. We do not, as educators, know enough about the market for continuing education. What will individual professionals pay for continuing education? What will institutions or agencies pay for staff members to participate? What are the rewards,

financial and in status, for the individual who goes through any of these suggested programs? The lack of hard data makes commitment to such programs difficult and high-risk. Indications from past experience show a high need for such programs before the fact, but actual participation is frequently disappointing, if not disastrous. What is needed now is the development of a professional "culture" in which continuing education is recognized as a way of life. One might add an important professional competency to those listed in Section D - that of being a continual, self-motivated, self-directed, life long learner.

2. Professional Education

In the light of the predictions discussed at the beginning of this section, there may well be an overproduction of undertrained library professionals during the next decade unless major changes take place at the level of the first professional degree. In the context of the needs of the NCLIS Program, present M.S.L.S. (or equivalent) programs portray the following characteristics.

a. The course of study is limited by the need for students to find jobs and courses are pitched only at the skill level, thus restricting vision and mobility in the larger information context.

b. Within the academic setting, schools of library science are frequently marginal, with the smallest faculty and number of students. Consequently this results ina lack of political power within their parent institution. In a way this reflects the low expectations of the profession as a whole.

c. The majority of students who apply to and are accepted by library schools are self-selected to match an image of the library which should no longer be (but probably is) valid. There is a need to recruit high quality students aggressively from a broad variety of backgrounds, especially those who may have some of the competencies discussed in Section D.

d. Faculties are frequently poorly prepared to meet (a) the needs of a high technology information culture, and (b) the parallel need for professionals who are sensitive to individual information needs and are able to negotiate substantively and empathetically with individuals in their own domains and contexts.

These are approximate generalizations. There are notable exceptions both on the individual and the program level. However, beginning professional training will require some major changes in order to meet the needs of

the Commission's Program. Three aspects are in particular need of change: curriculum, student recruiting, and faculty competence. It may be that the second and third are more important than curriculum revision. As Jencks and Reisman point out in their book The Academic Revolution:

> We have repeatedly argued (they write) that this sorting and certifying is considerably more important than what the schools actually try to teach. Just as it is easier to change the character of a college by changing the admission requirements than by changing curriculum, so too it is easier to change a profession by recruiting new sorts of apprentices than by changing the rules of apprenticeship. Professional schools have their students for only a few years and they can do only so much with whatever raw material they get. But to the extent that they are overapplied and can select their raw material according to some preconceived plan, they can influence the profession they serve decisively. (10)

How these changes can be accomplished is a more difficult matter. Undoubtedly certain library and information schools will take the initiative on their own.

Under the circumstances, this author can only recommend that the Commission put its moral weight behind curricular experimentation and the recruiting of students with particular attention paid to the competencies listed and discussed in Section D.

Another approach might be taken in the establishment of two-year programs for the professional degree,

somewhat along the lines suggested in the discussion of continuing education above. This would have several possible arguments for it.

a. It would allow more time to develop a true sense of professionalism, not possible in one-year programs.

b. It would provide time for offering the variety of knowledges, skills, and attitudes necessary for the Commission's objectives.

c. It would provide the opportunity to recruit and admit students into the profession who meet a different set of quality, educational, and behavioral standards.

It is probable that several schools will move to the two-year program during the 1970's. Three dangers exist however. Such programs may merely be extensions of the present professional library programs rather than attempts to meet the broader needs of the total information community. Secondly, such programs may isolate the present librarian who does not have the attitudes, skills, and knowledges necessary to play a significant role in a dynamic information culture. Third the development of these programs may cause a major split in the library profession. These factors must be recognized.

In this context it is necessary to strengthen the view of the field as a spectrum from services to system design to information science. A student, a professional, or a scientist should be able to see himself along this spectrum, with some understanding of the inter-connectedness of the variety of activities, problems, and educational programs. The dichotomies that are beginning to appear, e.g. between librarians and information scientists, must not be encouraged. The professional schools themselves must also realize that individually they cannot cover the entire spectrum. They must also begin to specialize, thereby concentrating more of their efforts on program quality and program depth.

3. Research

In line with the long-range needs for systems development, there is a need to support actively several centers of excellence. These would be schools where the interplay between professional education, policy research, and fundamental research can be stressed and encouraged. Of particular research concern are problems centered around the role of information in a complex information-rich society and the agencies, systems (both formal and informal), and dynamic processes that exist or can be encouraged in support of information transfer. Research on societal communication

must not only be encouraged, but its relationship to and impact on such services as libraries must be recognized, and translated into frameworks for effective action. There is an immediate need to isolate and define the areas of fundamental research so that, by 1980, a basic science of information with all its ramifications will be recognized as a legitimate field of endeavor.

Support for this should take the form of basic program development grants, based on the level of program planning and faculty qualifications. Tuition and scholarship assistance should be made available to a highly selected number of doctoral students who have the potential for providing a future core for ongoing policy and fundamental research. The necessary interface between practitioner and researcher can be encouraged only when the two have a context within which communication can take place.

F. Summary

This report makes the following major points

-Libraries are part of a larger information infrastructure. We cannot understand, let alone make decisions about, professional education in an information culture unless we have a better understanding of the linkages among the agencies, industries, formal and informal networks, and technologies that feed and support the information transfer process.

-There are three major areas of research and development necessary to support the long-range growth of the Commission's proposals.

a. policy research to provide an assessment of the range of options within the overall objectives.

b. generalizable research on the information needs of different types of audiences and information environments, including better definition of information in all its modes and formats.

c. technological and economic research and development of comparable system costs, information product development, cost-effectiveness of varying delivery systems for differing audiences.

-There is a fundamental need to re-adjust the vision of the profession - to view a different set of problems - because the decisions made now will determine the form and shape of information systems in this country for at least the next quarter of a century.

-Based on the objectives of the National Commission proposal, professionals will need to have competencies in five major areas: organization of information, information needs and information use, information technologies, research methods, and management.

-Continuation of present professional education patterns will tend toward an overproduction of undertrained library professionals unless major changes take place in student recruitment, faculty competence, and curricula.

-To meet short-term needs, two approaches are suggested in continuing education. First a series of one to two week institutes in three parts should be supported over a period of three years: experiential seminars for change agents; information networks and technology; information use and community analysis. Second, the development of future-oriented programs (Certificate of Advanced Studies, etc.) should be encouraged.

-Efforts to meet the short-term needs of manpower through continuing education are inhibited at present because there is no pattern of rewards, financial or status, for individuals who participate in such programs. A professional "culture" must be encouraged that recognizes and rewards professional growth.

-Long-term manpower needs will require major changes in professional education. There appears to be a growing need for persons in libraries with less library training, and concomitantly a growing need for professionals who can deal with the total information process, who are not institution-bound. This will tend to isolate some librarians who do not have the attitudes, skills, and knowledges necessary to play a significant role in an information culture.

-There is an immediate need to isolate and define areas of fundamental research so that, by 1980, a basic science of information will be recognized as a legitimate field of endeavor.

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